

CLAIMS

1. A radio-frequency transponder device, comprising:
 - an antenna circuit configured to receive radio-frequency signals and to return modulated radio-frequency signals via continuous wave backscatter in response to the received radio-frequency signals;
 - a modulation circuit coupled to the antenna circuit and configured to generate the modulated radio-frequency signals in response to the received radio-frequency signals; and
 - a microprocessor coupled to the antenna circuit and configured to receive operating power from the received radio-frequency signals and further configured to monitor inputs on at least one input pin and to generate responsive signals to the modulation circuit for modulating the radio-frequency signals in response to an input signal received on the at least one input pin.
2. The device of claim 1 wherein the at least one input pin comprises at least one input-and-output pin, and wherein the microprocessor circuit is configured to generate an output on the at least one input-and-output pin in response to the received radio-frequency signals.
3. The device of claim 2, further comprising an electrical energy storage device for storing electrical energy and supplying power to the microprocessor circuit.
4. The device of claim 1, further wherein the at least one input pin is configured to be coupled to an external device for receiving input signals to be processed by the microprocessing circuit.

5. The device of claim 4 wherein the microprocessor is configured to receive both analog and digital signals on the at least one input pin.

6. The device of claim 3, wherein the electrical energy storage device is configured to receive and store electrical energy from the received radio-frequency signals.

7. A radio-frequency identification system, comprising:
an interrogation device for generating radio-frequency signals and for receiving modulated radio-frequency signals; and
a transponder device, comprising:
an antenna circuit configured to receive the radio-frequency signals and to return modulated radio-frequency signals via continuous wave backscatter in response to the received radio-frequency signals;
a modulation circuit coupled to the antenna circuit and configured to generate the modulated radio-frequency signals in response to the received radio-frequency signals; and
a microprocessor coupled to the antenna circuit and configured to receive operating power from the received radio-frequency signals and further configured to monitor inputs on at least one input pin and to generate responsive signals to the modulation circuit for modulating the radio-frequency signals in response to an input signal received on the at least one input pin.

8. The system of claim 7 wherein the at least one input pin comprises at least one input-and-output pin, and wherein the microprocessor circuit is configured to generate an output on the at least one input-and-output pin in response to the received radio-frequency signals.

9. The system of claim 8, further comprising an electrical energy storage device for storing electrical energy and supplying power to the microprocessor circuit.

10. The system of claim 7, further wherein the at least one input pin is configured to be coupled to an external device for receiving input signals to be processed by the microprocessing circuit.

11. The system of claim 10 wherein the microprocessor is configured to receive both analog and digital signals on the at least one input pin.

12. The system of claim 7, wherein the electrical energy storage device is configured to receive and store electrical energy from the received radio-frequency signals.

13. A radio-frequency transponder device, comprising:
means for receiving radio-frequency signals and for reflecting modulated radio-frequency signals via continuous wave backscatter;
means for generating the modulated radio-frequency signals in response to the received radio-frequency signals; and
means for processing at least one input signal received on at least one input pin adapted for connection to an external device, the processing means coupled to the receiving means and the modulation means and configured to receive operating power from the received radio-frequency signals and to generate control signals to the modulation means in response to the input signal received on the at least one input pin.

14. A radio-frequency transponder system, comprising:
means for generating radio-frequency signals and for receiving modulated radio-frequency signals;

means for receiving the radio-frequency signals and for generating the modulated radio-frequency signals in response thereto, the modulation means configured to extract operating power from the received radio-frequency signals; and

means for processing at least one input signal received on at least one input pin, the processing means adapted to extract operating power from the received radio-frequency signals, the processing means coupled to the modulation means and configured to generate a control signal to the modulation means in response to the received input signal from the at least one input pin.

15. The system of claim 14 wherein the processing means is configured to generate at least one output signal to at least one output pin in response to the received radio-frequency signals.

16. The system of claim 14 wherein the at least one input pin and the at least one output pin are adapted for connection to at least one external device.

17. The system of claim 14, further comprising means for storing electrical power, the storing means coupled to the processing circuit for supplying operating power to the processing circuit.

18. The system of claim 17, wherein the storing means is configured to store electrical energy extracted from the received radio-frequency signal.

19. The system of claim 16 wherein the processing circuit is configured to receive both analog and digital signals on the at least one input pin.